detected in response to a variation in voltage due to the electrical resistance variation.

[0195] The electrode layers 39 and 39 deposited both sides of the multilayer film 35 are formed to extend over the multilayer film 35, and the width dimension of the top surface of the multilayer film 35 having no electrode layers 39 formed thereon is the optical read width dimension O-Tw.

[0196] The magnetic read track width M-Tw determined by the width dimension of the sensitive region E not covered with the electrode layers 39 and 39 is equal to the width dimension T9, which is also equal to the size of the sensitive region E.

[0197] Since the electrode layer 39 formed on the multilayer film 35 is narrower than the width of the insensitive region D, and does not fully cover the insensitive region D in this embodiment, the optical read track width O-Tw is larger than the magnetic read track width M-Tw. The electrode layers 39 and 39 formed on the multilayer film 35 may fully cover the insensitive regions D and D, setting the optical read track width O-Tw and the magnetic read track width M-Tw (i.e., the width dimension of the sensitive region E) to approximately the same dimension.

[0198] The percentage of the sense current flowing from the electrode layers 39 and 39 to the multilayer film 35 without passing through the hard bias layers 37 and 37 is increased in this invention. With the electrode layers 39 and 39 respectively extending over the insensitive regions D and D, the junction area of the multilayer film 35 and the hard bias layers 37 and 37 and the electrode layers 39 and 39 is increased, reducing the direct current resistance (DCR) and improving the reproduction characteristics.

[0199] Furthermore, the electrode layers 39 and 39 extending over the insensitive regions D and D restricts the sense current from flowing into the insensitive regions D and D, thereby controlling the generation of noise.

[0200] As shown in FIG. 4, the width dimension T11 of the electrode layer 39 extending over the insensitive region D of the multilayer film 35 preferably falls within a range from $0\,\mu$m to $0.08\,\mu$m. More preferably, the width dimension T11 falls within a range from $0.05\,\mu$m to $0.08\,\mu$m.

[0201] The angle θ4 made between the top surface 15a of the protective layer 15 and an end face 39a of the electrode layer 39 extending over the insensitive region of the multilayer film 35 is preferably 20 degrees or greater, and more preferably 25 degrees or greater. This arrangement prevents the sense current from shunting into the insensitive region, thereby controlling the generation of noise.

[0202] If the angle θ4 made between the top surface 15a and the end face 39a is too large, a short is likely to occur between the electrode layer 39 and a top shield layer of a soft magnetic material when the top shield layer is deposited over the protective layer 15 and the electrode layers 39 and 39. The angle θ4 made between the top surface 15a and the end face 39a is preferably 60 degrees or smaller, and more preferably, 45 degrees or smaller.

[0203] A spin-valve type thin-film device of a fifth embodiment of the present invention shown in FIG. 5 has a construction identical to that of the spin-valve type thin-film device shown in FIG. 4. However, the width dimension of a multilayer film 40 in the spin-valve type thin-film device

in FIG. 5 is set to be larger in the X direction than that of the top surface of the multilayer film 35 in the spin-valve type thin-film device shown in FIG. 4.

[0204] The width dimension of the sensitive region E of the multilayer film 40 shown in FIG. 5 is thus larger than the width dimension T9 of the sensitive region E of the multilayer film 35 shown in FIG. 4.

[0205] The electrode layers 39 and 39 deposited on both sides of the multilayer film 40 extend over the multilayer film 40, and the width dimension of the top surface of the multilayer film 40 having no electrode layers 39 and 39 formed thereon is defined as the optical read track width O-Tw.

[0206] Since the electrode layers 39 and 39 formed on top of the multilayer film 40 substantially cover the insensitive regions D and D as shown FIG. 5, the optical read track width O-Tw becomes approximately equal to the magnetic read track width M-Tw (i.e., the width dimension of the sensitive region E) determined by the width dimension of the sensitive region E not covered with the electrode layers 39 and 39. It is not a requirement that the electrode layers 39 and 39 fully cover the insensitive regions D and D. If the electrode layers 39 and 39 do not fully cover the insensitive regions D and D, the optical read track width O-Tw becomes larger than the magnetic read track width M-Tw. The width dimension T13 of each of the electrode layers 39 and 39 extending over the insensitive regions D and D of the multilayer film 40 preferably falls within a range from $0\,\mu$m to $0.08\,\mu$m. More preferably, the width dimension T13 falls within a range from $0.05\,\mu$m to $0.08\,\mu$m.

[0207] The angle θ5 made between the top surface 15a of the protective layer 15 and an end face 39a of the electrode layer 39 extending over the insensitive region of the multilayer film 40 is preferably 20 degrees or greater, and more preferably 25 degrees or greater. This arrangement prevents the sense current from shunting into the insensitive region, thereby controlling the generation of noise.

[0208] If the angle θ5 made between the top surface 15a and the end face 39a is too large, a short is likely to occur between the electrode layer 39 and a top shield layer of a soft magnetic material when the top shield layer is laminated over the protective layer 15 and the electrode layers 39 and 39. The angle θ5 made between the top surface 15a and the end face 39a is preferably 60 degrees or smaller, and more preferably, 45 degrees or smaller.

[0209] FIG. 6 is a cross-sectional view showing the construction of the magnetoresistive-effect device of a sixth embodiment of the present invention, viewed from an ABS side thereof.

[0210] This spin-valve type thin-film device is a so-called dual spin-valve type thin-film device, which includes a free magnetic layer 44, nonmagnetic electrically conductive layers 45 and 43 respectively lying over and under the free magnetic layer 44, pinned magnetic layers 46 and 42 respectively lying over and under the nonmagnetic electrically conductive layers 45 and 43, and antiferromagnetic layers 47 and 41 respectively lying over and under the pinned magnetic layers 46 and 42. The dual spin-valve type thin-film device provides a reproduction output higher in level than that of the spin-valve type thin-film devices (i.e., so-called single spin-valve type thin-film devices) shown in